

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

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In the Matter of an Investigation into Using
Rate Design to Achieve the Demand-Side
Management Goals of Xcel Energy

ISSUE DATE: November 1, 2002

DOCKET NO. E-002/CI-01-1024

ORDER ADDRESSING ISSUES BEYOND
XCEL's RESIDENTIAL TIME OF USE PILOT
PROGRAM

PROCEDURAL HISTORY

On May 14, 2001, the Commission approved certain changes to the "Saver's Switch" program of Northern States Power Company d/b/a Xcel Energy (Xcel), which is designed to lower total demand for electricity. As part of this Saver's Switch Order, the Commission also directed Xcel to file a report on how the Saver's Switch program might be improved, how it compares to other ways of improving Xcel's system efficiency, and how to implement rates that change automatically as the cost of providing electricity changes (called "real-time pricing" or RTP).¹ Xcel filed reports on June 15 and July 30, 2001.

On May 18, 2001, Lakehead Pipe Line Company, Inc., (now Enbridge Energy (Enbridge)) asked the Commission to explore changing the way Xcel recovers its "fuel clause adjustment" (FCA) costs, including much of the cost of electricity bought from other generators. Specifically, Enbridge proposed allocating these costs among customers differently depending on the customer uses of electricity at times of high demand and low demand.²

¹ See *In the Matter of a Petition by Northern States Power Company d/b/a Xcel Energy for Approval of Changes to the Controlled Air Conditioning Riders*, Docket No. E-002/M-01-46, and *In the Matter of a Request by Northern States Power for Modification of the Controlled Air Conditioning Riders*, Docket No. E-002/M-99-1734, ORDER APPROVING TARIFF CHANGES WITH MODIFICATIONS AND REQUIRING REPORT (May 14, 2001) (Saver's Switch Order).

² *In the Matter of the Review of the 2000 Annual Automatic Adjustment of Charges for all Gas and Electric Utilities*, Docket No. G-999/AA-00-1027 (2000 AAA Docket), Comments of Lakehead Pipe Line Company, Inc.

On July 20, 2001, in the context of a docket exploring Xcel's anticipated resource needs,³ the Commission opened the current investigation into whether and how to change Xcel's rate structure to promote energy efficiency, conservation, load-shifting, and other beneficial responses.

On October 1, 2001, Xcel filed comments.

On October 2, 2001, the Commission solicited comments on Xcel's reports required by the Saver's Switch Order, as well as on a list of other rate design issues.

On October 22, 2001, the Commission held an informational meeting for Xcel to discuss how total customer demand for electricity changes over time, and how Xcel meets this demand.

On October 26, 2001, the Commission received comments from the American Water Works Association.

On November 8, 2001, in the *RTP Dockets*⁴ the Commission permitted Xcel to withdraw its proposed changes to its RTP tariff,⁵ noting that the issues relevant to that tariff could be raised in the current docket.

By November 16, 2001, the Commission had received comments from Clean Water Action, Enbridge, Minnesota Power and the North American Water Office. The Commission also held an informal meeting with Schlumberger-Sema on November 16.

On December 17, 2001, the Commission received comments from Xcel, as well as the Department, International Paper and Minnesota Energy Consumers (MEC).

On December 18, 2001, the Commission concluded that the current docket should address the issue of disaggregating the FCA into two components: one component reflecting the cost of providing service during periods of high demand, and another component reflecting the cost of providing service during periods of lower demand.⁶

³ *In the Matter of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan*, Docket No. E-002/RP-00-787.

⁴ *In the Matter of a Request by Northern States Power Company d/b/a Xcel Energy to Extend its Existing Experimental Real Time Pricing Pilot Service and for Approval of a New Real Time Pricing Service Tariff*, Docket No. E-002/M-00-1513, *In the Matter of a Petition of Northern States Power d/b/a Xcel Energy to Extend the Availability Period of its Experimental Real Time Pricing Service and Approval of a New Real Time Pricing Service Tariff*, Docket No. E-002/M-01-387 (*RTP Dockets*).

⁵ *Id.*, ORDER PERMITTING WITHDRAWAL OF TARIFF, AND EXTENDING CURRENT REAL TIME PRICING PROGRAM.

⁶ *2000 AAA Docket*. ORDER ACTING ON GAS AND ELECTRIC UTILITIES' 2000 ANNUAL AUTOMATIC ADJUSTMENT REPORTS AND SETTING FURTHER REQUIREMENTS (December 18 Order).

On December 28, 2001, Xcel filed a discussion proposal for a residential time-of-use (TOU) rate.

On January 31, 2002, the Commission received reply comments from Xcel, as well as the Department, International Paper, MEC, and the Residential and Small Business Utilities Division of the Minnesota Office of the Attorney General (RUD-OAG).

On February 14, 2002, the Commission issued its ORDER ESTABLISHING PROCEDURAL SCHEDULE for the development of a residential TOU tariff, designed to let the price of electricity vary throughout the day to reflect the typical cost of electricity at that time of day.

Thereafter this docket has focused on Xcel's residential TOU pilot program. But the broader issue of how Xcel might use rate design to achieve demand-side management goals came before the Commission on August 8, 2002.

FINDINGS AND CONCLUSIONS

I. Background

The Commission has long expressed an interest in setting prices to better reflect the cost of providing electricity, especially as the cost changes over time.

Historically an electric utility charges residential customers on the basis of the amount of electric energy consumed, regardless of when the electricity is consumed. But the cost of supplying electricity changes over time due to factors such as changes in demand, contract obligations, system reliability concerns, and fluctuations in the spot market for wholesale electricity. For example, a cost-conscious electric utility will tend to use its most efficient electric generators or cheapest supply contracts as much as possible. But as demand increases, the utility must rely on ever more costly sources of supply, resulting in a higher average cost per unit of output.

Efficiency may be reduced when the price of electricity does not reflect its marginal cost. At some point, the cost the utility bears to provide an additional unit of electricity may exceed the value of that electricity to a customer. Some customers may be willing to reduce their electric consumption at times of high electricity cost. This customer response can benefit society at large by conserving energy, reducing pollution, and reducing the costs that a utility passes on to all ratepayers.

There are various ways that an electric utility might encourage customers to reduce consumption permanently (conservation) or temporarily, shifting consumption to a time of lower system demand (load-shifting). The current docket was opened to encourage conservation and load-shifting by changing the formula Xcel uses to charge customers for service.

One way to reduce the need for electricity at times of peak demand is to pay customers to reduce consumption at these times. Xcel's "Saver's Switch" program is an example of this strategy. Alternatively, a utility can charge more for electricity consumed at times of high demand and less for electricity consumed at times of low demand, thereby permitting customers to bear more of the costs of their own consumption, and reap more of the benefits of their own conservation or load-shifting. Time of use (TOU) rates and real-time pricing (RTP) programs are examples of this strategy. These strategies, among others, are discussed below.

II. Saver's Switch

A. Description

Xcel offers its Saver's Switch program⁷ to residential customers with electric water heaters or air conditioners, and to commercial and industrial customers with electric air conditioners. In return for a reduction on their electric bills, customers agree to let Xcel turn off these appliances for 15 minutes out of every half hour, up to 300 hours each year. Using this program, Xcel can cause customers to "take turns" in running these appliances, thereby reducing the simultaneous demand that they put on Xcel's system.

Traditionally, Xcel interrupts these appliances only 10 - 15 days each year. The Department suggests that Xcel could achieve greater benefits if it exercised its rights under the Saver's Switch program more often -- specifically, whenever sufficient load is available, and avoided costs outweigh the direct cost for ratepayers. The Department argues that Xcel should, and does, have the flexibility to use the Saver's Switch program for economic purposes, to reduce purchased power costs for ratepayers.

The Department recommends that Xcel annually report on how the program is being used to benefit ratepayers. Xcel expresses willingness to make such filings.

B. Commission Action

The Commission agrees with the Department that the Saver's Switch program tariff gives Xcel the discretion to interrupt a customer's appliances up to 300 hours per year. This gives Xcel the discretion to use the program more broadly, including using it to reduce purchased power costs for its native load customers.

That being said, the Commission also sees the merit in the Department's recommendation to advise current Saver's Switch customers of any change to the program's implementation. Such notice would permit a customer to drop out of the program before any change began, if he or she wished. This practice is consistent with past Orders changing the Saver's Switch program,⁸ and would ensure that the only customers remaining on the program would be those who knowingly accepted the costs, as well as the benefits, of the program.

Finally, the Commission will adopt the Department's recommendation and direct Xcel to report annually on the benefits of the Saver's Switch program. An ongoing review would permit all parties to verify that Xcel was using the program to benefit ratepayers. The Commission will direct Xcel to report --

- the number of customers signed up for the program, and the megawatts (MW) of demand they place on the system,

⁷ Residential Controlled Air Conditioning And Water Heating Rider; Commercial and Industrial Controlled Air Conditioning Rider.

⁸ See the Saver's Switch Order.

- the number of customers opting out of the program, and the number of MW they represent,
- an estimate of the total MW interrupted during each hour of interruption, and
- an estimate of Xcel's avoided cost during each hour of interruption.

With this safeguard in place, the Commission anticipates that Xcel's Saver's Switch program will yield greater benefits for all parties.

III. Time of Use (TOU) Fuel Clause Adjustment (FCA)

The Commission establishes the rates for electric utility service after a lengthy process known as a general rate case. These "base rates" are designed to recover the utility's cost of providing service, including estimated fuel costs and costs for electricity generated by entities other than the utility (purchased power). But costs for fuel and purchased power tend to vary more than most other utility costs, and represent a sizable portion of an electric utility's budget. Rather than conduct frequent general rate cases to reflect these changes, the Commission permits electric utilities to adjust their rates monthly to accommodate changes in fuel and purchased power costs. Minnesota Rules parts 7825.2390 - .2920. This rate change is called a fuel clause adjustment (FCA).

The FCA allocates the cost for purchased power uniformly to ratepayers in proportion to the amount of energy they consume, regardless of when they consume it. But as noted above, a utility's cost for electricity is not uniform; it tends to increase at times of higher demand.

Minnesota Power stresses the importance designing base rates to reflect fuel costs appropriately; Enbridge and International Paper echo this general concern, but focus it specifically on the FCA allocation. They argue that the FCA allocates too much cost to customers using electricity at times of low demand, and too little cost to customers using electricity at times of high demand. This distorts a customer's incentive to conserve or shift load. They note that Minnesota Statutes § 216B.03 directs the Commission to set rates to encourage energy conservation and renewable energy use.

Parties suggest various ways to address this problem.

- The Department, Enbridge, International Paper and Minnesota Energy Consumers agree that a general rate case would provide the best opportunity to implement the broadest assortment of changes designed to promote demand-side management goals. But the Department and Xcel note that such cases are expensive and time-consuming, delaying any potential remedy.
- Enbridge and International Paper recommend allocating FCA costs to customers based on their time of use (TOU). The cost of power purchased to serve times of high demand should be allocated in proportion to a person's consumption of electricity during those times; purchased power costs for low-demand times should be allocated similarly. The Department agrees with this analysis in principle, but observes that the remedy would require new electric meters able to record the time that electricity was consumed. The cost of these meters would offset the efficiencies the solution is intended to produce.

- The Department, International Paper and Xcel suggest that Xcel could develop some kind of proxy for a TOU FCA. The Department argues that changing the base rates to more accurately reflect the cost of energy and capacity when it is used would be the most effective way to increase the economic efficiency of Xcel's rates. It would permit Xcel to achieve many of the benefits of a TOU FCA at a fraction of the cost.
- International Paper and Xcel also suggest a reallocation of FCA costs among classes of customers with similar usage patterns – classes such as residential, commercial, and industrial customers. They suggest that the FCA may not adequately reflect differences in the costs for serving different customer classes.

While the Commission is not yet persuaded that this issue warrants a full rate case, the Commission agrees that the issue deserves further exploration. Consequently, the Commission will direct Xcel to propose, within 30 days, how to reset its fuel clause adjustment base amount and reallocate the new base to rate classes with updated cost and use information, other than via a rate case.

IV. Real-Time Pricing

As noted above, the cost to provide service varies across time. Generally, a TOU system permits rates to vary across time to reflect this change in the cost of service. For example, a TOU system might charge one rate for electricity used during daylight hours, and another price for electricity used at night. A consumer would know these different rates, and could adjust his or her behavior accordingly.

A "real-time pricing" (RTP) system is a type of TOU system in which the price for electricity is set virtually in real time -- typically one day beforehand. This system has the advantage of informing customers of the cost of service at any given time, and provides the appropriate incentive to change consumption at any time. But the system poses administrative challenges for both the utility and the customer.

Xcel has a RTP pilot program in effect for large industrial customers. Xcel, the Department and other parties were in the process of revising this program in the *RTP Dockets* when Xcel withdrew its proposal.

The Department argues that Xcel's RTP rate could be improved by providing more benefits for ratepayers than is currently provided in the passive savings given to RTP customers who already use less electricity during on-peak periods. The Department argues that participants should be given benefits only if they change behavior to use less electricity during periods of high demand. Xcel expressed a willingness to work with the Department and other parties in addressing RTP again. No party opposed this idea.

Without ruling on the merits of the Department's specific proposal, the Commission is persuaded that Xcel's RTP tariff warrants further exploration. Consequently, the Commission will direct Xcel to file a new proposal for a large industrial RTP rate, addressing the issues raised by the parties in the earlier *RTP Dockets*.

V. Other Options

Parties propose many other options for the Commission's consideration, including --

- conducting an entire rate design proceeding, determining whether the rates allocate costs appropriately among the members of each customer class;
- conducting a cost-of-service study seeking to determine, among other things, whether each customer class (residential, commercial, industrial) is bearing its fair share of the utility's costs;
- exploring TOU and/or RTP rates for residential, small commercial, large commercial, and industrial customers;
- adjusting the periods designated as “high demand” or “low demand” in tariffs that charge different amounts during times of high demand than during times of low demand;
- implementing a company-wide customer-education program similar to the Personal Energy Management program offered by Puget Sound Energy (PSE) at <http://www.pse.com>, which informs customers about how to save energy and how much a customer’s bill would be if he or she were being charged on the basis of a rates that varied at different times of the day (“time of day” rates);
- visiting PSE to discuss the successes and failures of its programs;
- studying the rate at which electric consumption decreases as the price increases;
- changing the discounts given to people who agree to let Xcel interrupt their service;
- expanding the Saver's Switch program to increase participation, or apply to more types of appliances, or apply for more hours per year, or offer increasing incentives to people who agree to be interruptible for more hours each year;
- using non-traditional rate design options such as --
 - a) incorporating the cost of externalities in the price of electricity,
 - b) increasing the price of electricity when consumption exceeds some base level,
 - c) letting customers sell power directly into the reserve power market,
 - d) selling risk management options to customers,
 - e) using demand-limiting devices,
 - f) recovering delivery and transmission costs differently,
 - g) selecting an independent third party to propose, implement and manage new market-based rates, including services to encourage customer-driven demand response;
- adopting specific rate design principles; and
- expanding the docket to include other utilities.

Having reviewed the filings, the Commission is not persuaded to implement these other suggestions at this time. But this finding should not be construed as rejection of these ideas. To the contrary, the Commission will direct Xcel to continue exchanging information on all these options with the Commission and its staff, the Department and Office of Attorney General's Residential and Small Business Utilities Division. This ongoing collaborative analysis may yet yield new and innovative ways to use Xcel's rate structure to advance demand-side management goals.

The Commission will so order.

ORDER

1. The Commission finds that broader use of the Saver's Switch program to reduce purchased power costs for native load customers is allowed under the current Saver's Switch tariff.
2. Xcel shall notify affected customers of any change in the potential frequency of use and the purpose of the Saver's Switch program and allow them an opportunity to opt out.
3. Xcel shall file an annual report to verify that ratepayers are benefitting from any economic use of the Saver's Switch program. The report should include the following:
 - A. the number of customers and megawatts (MW) signed up for the program,
 - B. the number of customers (and MW) opting out of the program,
 - C. an estimate of the total MW interrupted during each hour of interruption, and
 - D. an estimate of Xcel's avoided cost during each hour of interruption.
4. Within 30 days of this Order, Xcel shall file a proposal to reset its fuel clause adjustment (FCA) base amount and reallocate the new base to rate classes with updated cost and use information, other than via a rate case.
5. Xcel shall file a new proposal for a large industrial real-time pricing (RTP) rate, addressing the issues raised by parties in the *RTP Dockets*.
6. Xcel shall pursue an ongoing information exchange on issues not addressed in this order with the Commission, Commission staff, the Minnesota Department of Commerce and the Minnesota Office of Attorney General's Residential and Small Business Utilities Division.

7. This Order shall become effective immediately.

BY ORDER OF THE COMMISSION

Burl W. Haar
Executive Secretary

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